

## AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings of claims in the application.

### Listing of Claims:

1. (currently amended) A structure for trellis coding and decoding, of extended memory Bit Rate Agile (BRA), Modulation-Demodulation (Modem) Format Selectable (MFS) and Code Selectable (CS) input port for receiving input data comprising:

10 a trellis encoder;

a BRA, MFS and CS splitter having an input coupled to said input port, and serving to split said input data into baseband signal streams;

a BRA, MFS and CS baseband signal processing network for receiving said baseband signal streams and providing BRA, MFS and CS in-phase (I) and quadrature (Q) phase baseband

15 signals to the I and Q input ports of the a transmitter;

means for baseband signal processing for receiving said baseband signal streams and providing for BRA, MFS and CS systems changeable amounts of cross-correlation;

means for selectively reducing the a cross-correlating factor down to zero between Time Constrained Signal (TCS) response processors combined with TCS and Long Response (LR)

20 processors;

a BRA and MFS quadrature demodulator;

a receiver port for connection of the received cross-correlated signal to the BRA and MFS demodulator; and

a BRA and MFS quadrature demodulator; and

25 a Mis-Matched (MM) BRA and MFS demodulator filter set in which the said a demodulator filter set is MM-mis-matched to that of the a BRA and MFS filter set of the a modulator.

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12. (currently amended) A cross correlated quadrature architecture signal processor for producing Bit Rate Agile (BRA), cross-correlated in-phase and quadrature phase signal streams for modulation by a Quadrature Modulator and transmission and for signal demodulation comprising:

5 (a) means for receiving an input BRA input signal selected from <sup>q</sup>the group of binary, multi-level, and analog signals and combinations thereof;

(b) filtering means for filtering of the BRA input signal to generate a filtered BRA input signal;

(c) BRA signal shaping means for shaping said filtered BRA input signal;

10 (d) amplification means for varying the a modulation index of said BRA shaped and filteredA input signal, said amplifier amplification means receiving said shaped filtered BRA input signal and providing an amplified input output signal;

(e) means for splitting said amplified output BRA signal to generate an in-phase and a quadrature-phase BRA signals<sup>s</sup>splitting for receiving said amplified input signal;

15 (f) cross correlation means for cross-correlating the in-phase and quadrature-phase output BRA data stream signals; and a BRA signal processor means having an in-phase and quadrature-a quadrature-phase channel each receiving one of said cross-correlated BRA signals data streams, each of said in-phase and quadrature quadrature-phase channel having a first BRA delay gain filter and; means for generating BRA Cosine and BRA Sine values for said  
20 in-phase and quadrature quadrature-phase BRA signal channel data stream;

(g) a BRA wave shaper and a second BRA delay gain filter, <sup>comprised of</sup> such that said BRA signal processor provides <sup>processed</sup> in-phase and quadrature-phase cross correlated data signal processed or signals;

25 (h) means for quadrature modulation of <sup>processed</sup> with a the in-phase and quadrature-phase cross correlated BRA modulated signals adaptable for generation of coherent or non-coherent demodulation of the quadrature BRA Frequency Modulated (FM) signals;

(i) controlling means and signal selection means for <sup>selecting a rate of said</sup> BRA rate processor selection;

(j) selection means for selecting Linearly and/or Non-Linearly Amplified (NLA) baseband and/or of modulated signals; and coupling port means for coupling the amplified signals  
30 to the transmission medium;

(k) BRA demodulator means;

(kl) receiver port means for connection of <sup>said amplified modulated</sup> ~~one or more received cross-correlated~~ signals to the BRA demodulator means; and

— (l) ~~BRA demodulator means~~; and

(m) Mis-Matched (MM) demodulator filtering means for <sup>a</sup> BRA, MFS and CS demodulation <sup>wherein the</sup> in which the <sup>filtered means</sup> said demodulator ~~filters set~~ are <sup>is</sup> MM-mis-matched to that of the BRA, MFS and BRA filters ~~set~~ of the modulator.

3/ (currently amended) A signal processing, modulation, transmission, signal reception and demodulation system, designated as Feher's Gaussian Minimum Shift Keying (GMSK), for Bit Rate Agile (BRA), Modulation Demodulation (Modem) Format Selectable (MFS) and Code Selectable (CS) systems comprising:

(a) an input port for receiving input data;

(b) a Gaussian low-pass filter and presetable gain integrator for processing said input data and providing filtered input data;

(c) a splitter having an input coupled to said input port, and serving to split said filtered input data into in-phase (I) and quadrature-phase (Q) channel cross coupled data streams <sup>which</sup> such that said I and Q channel data streams are proportional in gain and phase to said input data;

(d) a signal processing network for receiving said I and Q channel data streams and providing processed in-phase and quadrature-phase <sup>data streams</sup> signals, said signal processing network including a signal processor for varying the modulation index for said signal processing network;

(e) means for generating Cosine and Sine values for said processed I and Q channel BRA, MFS and CS data streams;

(f) means for filtering, by bit rate agile FIR or IIR or switched filter and/or other post-GMSK shaping filters or by a combination of these filters, said ~~signals~~ <sup>data streams</sup> in the I and Q channels such that said signal processor provides in-phase and quadrature-phase cross correlated data streams signals for quadrature modulation with a modulated signal suitable for amplification in linear and non-linear mode;

(g) means for providing the <sup>modulated</sup> amplified signal to the a transmission port;

(h) a BRA and MFS quadrature demodulator;

(hi) a receiver port for connection of the <sup>the</sup> ~~a~~ received <sup>amplified modulated</sup> ~~cross-correlated~~ signal to the BRA and MFS demodulator; and

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~~(i) a BRA and MFS quadrature demodulator; and~~

(j) a Mis-Matched (MM) BRA and MFS demodulator filter set ~~in which~~ the said demodulator filter set is MM-mis-matched to that of the BRA and MFS filter set of the modulator.

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